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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
10/820,770	04/09/2004	Ichiro Koiwa	OKI.651	8824
20987 75	590 07/26/2005		EXAM	INER
VOLENTINE FRANCOS, & WHITT PLLC			HOANG, QUOC DINH	
ONE FREEDO	M SQUARE OM DRIVE SUITE 1260	ART UNIT	PAPER NUMBER	
RESTON, VA			2818	
			DATE MAILED: 07/26/2005	5

Please find below and/or attached an Office communication concerning this application or proceeding.

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	Application No.	Applicant(s)
·	10/820,770	KOIWA, ICHIRO
Office Action Summary	Examiner	Art Unit
	Quoc D. Hoang	2818
The MAILING DATE of this communication Period for Reply	appears on the cover sheet w	th the correspondence address
A SHORTENED STATUTORY PERIOD FOR RE THE MAILING DATE OF THIS COMMUNICATIO  - Extensions of time may be available under the provisions of 37 CFF after SIX (6) MONTHS from the mailing date of this communication  - If the period for reply specified above is less than thirty (30) days, a  - If NO period for reply is specified above, the maximum statutory per  - Failure to reply within the set or extended period for reply will, by stany reply received by the Office later than three months after the meanned patent term adjustment. See 37 CFR 1.704(b).	N. R 1.136(a). In no event, however, may a r reply within the statutory minimum of thir riod will apply and will expire SIX (6) MON atute, cause the application to become AE	eply be timely filed  y (30) days will be considered timely.  THS from the mailing date of this communication.  ANDONED (35 U.S.C. § 133).
Status		_
<ul> <li>1) ⊠ Responsive to communication(s) filed on 1</li> <li>2a) ☐ This action is FINAL. 2b) ⊠ T</li> <li>3) ☐ Since this application is in condition for allo closed in accordance with the practice under the condition of t</li></ul>	This action is non-final. wance except for formal matt	
Disposition of Claims	•	
4)  Claim(s) 1-19 is/are pending in the applicate 4a) Of the above claim(s) is/are with 5)  Claim(s) is/are allowed.  6)  Claim(s) 1-3,7 and 8 is/are rejected.  7)  Claim(s) is/are objected to.  8)  Claim(s) are subject to restriction are subjection Papers	drawn from consideration.	
9)☐ The specification is objected to by the Exan		
10)☐ The drawing(s) filed on is/are: a)☐		
Applicant may not request that any objection to Replacement drawing sheet(s) including the column The oath or declaration is objected to by the	rrection is required if the drawing	(s) is objected to. See 37 CFR 1.121(d).
Priority under 35 U.S.C. § 119		·
12) Acknowledgment is made of a claim for force a) All b) Some * c) None of:  1. Certified copies of the priority docum 2. Certified copies of the priority docum 3. Copies of the certified copies of the application from the International Bu * See the attached detailed Office action for a	nents have been received. nents have been received in A priority documents have beer reau (PCT Rule 17.2(a)).	Application No  received in this National Stage
Attachment(s)		
Attachment(s)  1) Notice of References Cited (PTO-892)		Summary (PTO-413)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SE	,	s)/Mail Date Informal Patent Application (PTO-152)

U.S. Patent and Trademark Office PTOL-326 (Rev. 1-04)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/2005</u>.

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### **DETAILED ACTION**

### Election/Restrictions

- 1. Applicant's election without traverse of Group I (claims 1-3, 7 and 8) in the reply filed on 06/17/2005 is acknowledged.
- 2. This office action acknowledges receipt of the following items from the Applicant:
  - The Claims filed on 04/09/2004.
  - The Specification filed on 04/09/2004.
  - The Drawing filed on 04/09/2004.
  - The Abstract filed on 04/09/2004.
  - The Oath/declaration filed on 04/09/2004.

# Oath/Declaration

3. The Oath/declaration filed on 04/09/2004 is acceptable.

### **Priority**

4. Acknowledgment is made of applicant's claim for foreign priority base on an application No. 106601/2003 filed in Japan on 04/10/2003.

It is noted that Applicants have filled a certified copy of said application as required by U.S.C 119, which papers have been placed of record in the file.

# Information Disclosure Statement

5. The information disclosure statement (IDS) filed on 06/17/2004. The references cited on the PTOL 1449 Form have been considered.

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# Specification

6. The specification has been checked to the extent necessary to determine the present of all possible minor errors. However, Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

## Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- 8. Claims 1 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki et al., (US Pat No. 6,033,953) (hereinafter "Aoki").

Regarding claim 1, Aoki teaches a ferroelectric capacitor comprising:

- a bottom electrode 38 (col. 1, lines 14-57 and Fig. 14);
- a plurality of projection electrodes 38a formed on the bottom electrode 38 (col. 1, lines 14-57 and Fig. 14). It is noted that the convex parts 38a are considered the projection electrodes;
- a ferroelectric layer 40 formed on the bottom electrode 38 and the projection electrodes 38a (col. 1, lines 14-57 and Fig. 14); and

a top electrode 37 formed on the ferroelectric layer 40 (col. 1, lines 14-57 and Fig. 14).

Regarding claim 8, Aoki teaches wherein the bottom electrode 38 and the projection electrodes 38a are made of a same material (platinum) (col. 1, lines 50-55 and Fig. 14).

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### Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 10. Claims 2, 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al., (US Pat No. 6,033,953) (hereinafter "Aoki") in view of Lu., (US Pat No. 5,679,596).

Regarding claim 2, Aoki teaches a plurality of projection electrodes, but fails to teach wherein spacing between central portions of each projection electrode has a range from 10 % to 20% of a size of the ferroelectric capacitor.

However, Lu teaches wherein spacing between central portions of each projection electrode 14b has a range from 1.5 % to 75% of a size of the ferroelectric capacitor (col. 4, line 50 through col. 5, line 65 and Fig. 5). It is noted that the size of the ferroelectric capacitor is considered the width (2,000-10,000 Å) of the bottom electrode 11 (col. 4, lines 40-43), the width of the projection electrode 14b is between about 50-500 Å (col. 5, lines 17-18), and the spaces 14a between the projection electrode 14b are between about 100-1000 Å (col. 5, lines 19-21). Hence, after calculating, the spacing between central portions of each projection electrode 14b has a range from 1.5 % to 75% of a size of the ferroelectric capacitor. Since Aoki and Lu are all from the same field of endeavor, the purpose disclosed by Lu would have been recognized in the pertinent art of Aoki. It would have been obvious to a person of ordinary skill in the art at the

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time of the invention was made to provide spacing between central portions of each projection electrode in order to increase the surface area of the bottom electrode, therefore to obtain the desired increased capacitance as taught by Lu, column 5, lines 24 through col. 6, line 3.

Although Lu's percentage range (1.5 % to 75%) is not the claimed range (10 % to 20%), this does not define patenable over Aoki in view of Lu since it has been held where the general conditions of a claim are disclosed in the priort art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 3, Aoki teaches a plurality of projection electrodes, but fails to teach wherein wherein a size of each projection electrode has a range from 5 % to 10% of a size of the ferroelectric capacitor.

However, Lu teaches wherein a size of each projection electrode has a range from 0.5 % to 25% of a size of the ferroelectric capacitor (col. 4, line 50 through col. 5, line 65 and Fig. 5). It is noted that the size of the ferroelectric capacitor is considered the width (2,000-10,000 Å) of the bottom electrode 11 (col. 4, lines 40-43), the size of each projection electrode is considered the width of the projection electrode 14b, which is between about 50-500 Å (col. 5, lines 17-18). Hence, after calculating, a size of each projection electrode has a range from 0.5 % to 25% of a size of the ferroelectric capacitor. Since Aoki and Lu are all from the same field of endeavor, the purpose disclosed by Lu would have been recognized in the pertinent art of Aoki. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide a size of each projection electrode has a range from 5 % to 10% of a size of the ferroelectric capacitor in order to increase the surface area of the bottom electrode, therefore to

obtain the desired increased capacitance as taught by Lu, column 5, lines 24 through col. 6, line 3. Although Lu's percentage range (0.5 % to 25%) is not the claimed range (5 % to 10%), this does not define patenable over Aoki in view of Lu since it has been held where the general conditions of a claim are disclosed in the priort art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 7, Aoki teaches a plurality of projection electrodes, but fails to teach wherein the projection electrodes are arranged evenly spaced on the bottom electrode.

However, Lu teaches wherein the projection electrodes 14b are arranged evenly spaced on the bottom electrode 11 (col. 4, line 50 through col. 5, line 65 and Fig. 5). It is noted that the evenly spaced between the projection electrodes 14b is the width of the crevice or space 14a (col. 5, lines 19-21). Since Aoki and Lu are all from the same field of endeavor, the purpose disclosed by Lu would have been recognized in the pertinent art of Aoki. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide evenly spaced between the projection electrodes in order to increase the surface area of the bottom electrode, therefore to obtain the desired increased capacitance as taught by Lu, column 5, lines 24 through col. 6, line 3.

#### Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

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If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers of the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc Hoang

Patent examiner/AU 2818

07/22/2005